Open-class repair initiations in conversations involving middle-aged hearing aid users with mild to moderate loss

Laakso, Minna

2019-07

Laakso , M , Salmenlinna , I , Aaltonen , T , Koskela , I & Ruusuvuori , J 2019 , ' Open-class repair initiations in conversations involving middle-aged hearing aid users with mild to moderate loss ' , International Journal of Language and Communication Disorders , vol. 54 , no. 4 , pp. 620-633 . https://doi.org/10.1111/1460-6984.12466

http://hdl.handle.net/10138/326011
https://doi.org/10.1111/1460-6984.12466

unspecified
acceptedVersion

Open-class repair initiations in conversations involving middle-aged hearing aid users with mild to moderate hearing loss.

Minna Laakso[1], Inkeri Salmenlinna[1], Tarja Aaltonen[1], Inka Koskela[2] and Johanna Ruusuvuori[3]

1 University of Helsinki

2 Finnish Institute of Occupational Health

3 Tampere University

RUNNING HEAD: open-class repair initiations by hearing aid users

KEY WORDS: conversation, clarification, hearing aid, hearing loss, repair initiation

Declaration of interest: The authors declare no conflict of interests. The authors alone are responsible for the content and writing of the paper.

Abstract

Background: To manage conversational breakdowns, individuals with hearing loss (HL) often have to request their interlocutors to repeat or clarify.
Aims: This study examines how middle-aged hearing aid (HA) users manage conversational breakdowns by using open-class repair initiations (e.g., questions like *sorry*, *what* and *huh*), and whether their use of repair initiations differs from their normally hearing interlocutors.
Method: Eighteen 45 to 64 year old adults with acquired mild to moderate HL participated in the study. The participants were videotaped in everyday interactions at their homes and work places and in clinical encounters with hearing health professionals. Interactions were transcribed and open-class repair initiations of participants with HL and their interlocutors were identified using conversation analysis. The frequencies of initiations were analyzed statistically between the groups, and the contexts and structure of repair sequences dealing with communication breakdown were analyzed.
Results: Before acquiring HA the participants with HL reported intense use of open-class repair initiation. After HA was acquired, there was no statistically significant difference in the frequency of open-class repair initiations between HA users and their interlocutors. The most common means for open-class repair initiation in the data was interrogative word *mitä* ('what'). Vocalization *hä* ('huh'), apologetic expression *anteeksi* ('sorry') and clausal initiations (e.g. 'what did you say'/'I didn't hear') occurred less often. Open-class repair initiations emerged in contexts where they typically occur in conversation, such as topical shifts, overlapping talk and action, background noise, and disagreements. When used, open-class repair initiations most often led to repetition by the interlocutor, which immediately repaired the conversational breakdown. Long clarification sequences with multiple repair initiations did not occur.
Conclusions: Participants with mild to moderate HL using hearing amplification initiate open-class repair similarly as their normally hearing conversational partners when the frequency, types, contexts and structure of repair are considered. The findings diminish the stigma related to hearing loss, hearing aids, and the use of open-class repair. The findings suggest that hearing aid amplifies hearing successfully in everyday conversation when the level of HL is mild to moderate. The evidence for the benefit of HAs is indirect.
What this paper adds: The knowledge of repair behaviors can be utilized in communication therapy and counseling to encourage adults with HL to use HAs and to recognize open-class repair initiators as a beneficial conversational resource that their interlocutors with normal hearing similarly use.

Introduction

Hearing loss (HL) is a common condition that disturbs the auditory-sensory perception of sounds and speech (Tambs, 2004). In adults, its prevalence increases significantly with age and noise exposure (Dawes et al., 2014). In the middle-aged population, 45 to 64 year olds, prevalence of gradually acquired adult onset hearing loss ranges from 11 to 25% of the population (Hannula et al., 2010; Nash et al. 2011). Hearing problems are thus very common in middle-aged adults who are still active in work and social life. In these contexts, hearing problems may hamper fluent participation in conversation, which often lessens engagement in social interactions and leads to social isolation (e.g., Ciorba et al., 2012). Even adults with mild or unilateral HL have reported significant difficulties in conversation (Kramer et al., 1998; Newman et al., 1997). Conversational difficulties can be remedied by hearing aid (HA) that amplifies hearing, but adults with acquired HL seek HA rehabilitation late and don't always use the HAs they have acquired (e.g., McCormack & Fortnum, 2013; Salonen et al., 2013; Vestergaard Knudsen et al., 2010).

Research of conversational interactions of adults with acquired hearing loss is still scarce, even though the study of conversations can provide new scientific knowledge on the management of conversational breakdowns and the usefulness of hearing amplification in remedying the breakdowns, as previous studies have suggested (e.g., Lind, Hickson & Erber, 2010). Most of the prior studies have analyzed short clinical or simulated conversations in one-to-one settings where hearing conditions are good (e.g., Ekberg, Hickson & Grenness, 2017; Lind et al., 2004; Tye-Murray, et al., 2010). More research on complex social multiparty interactions in varying sound environments of everyday life is needed to explore the real-life management of conversational breakdowns. In this study, we

examine the effect of HA rehabilitation on social interaction by studying HA users' everyday conversations.

Adults with acquired hearing loss have difficulties in following the talk of others, and miscommunications may occur in conversation (Tye-Murray et al. 2010). Consequently, adults with HL can be perceived by others as slow cognitively or incompetent socially (Southall, Gagné & Jennings, 2010). A characterizing feature of talk by adults with HL is the frequent use of questions asking for clarification such as *what*, which is experienced as stigmatizing (see e.g., David & Werner, 2016; Gagné et al. 1991; Hétu, 1996). In particular, adults with HL perceived the frequent need for questioning as a major factor leading to discomfort and avoidance of social situations. In the current study, we examine the frequency and use of clarification questions in everyday conversations by participants using their first HAs. In our study the new HA users have been followed from the beginning of the rehabilitation, i.e., from hearing testing and uptake of the HAs, until eight months of HA use. The focus is on new HA users and middle-aged population, as the early start of rehabilitation is crucial for the successful adoption of HA use and for getting the most benefit out of it (cf. Davis et al., 2007). Furthermore, prior studies have mostly examined older populations with severe hearing loss in conversations gathered from interactions at hearing health services (e.g., Ekberg et al., 2017; Lind et al., 2004), or in one everyday context (usually home environment) (e.g., Pajo, 2013). Here we examine an understudied group, middle-aged adults with mild to moderate HL, in conversations at home, work, and in the hearing clinics.

Open- class repair initiation in conversation

Problems of hearing and understanding occur in all conversations. When problems occur, the participants in conversations use universally similar interactional repair practices to

restore their mutual understanding (Dingemanse et al., 2015). Within the conversation-analytic framework used in this study, these practices are conceptualized as *other-initiation of repair*, as they are used to address problems in the talk of another participant (Schegloff, Jefferson & Sacks, 1977). Other-initiations of repair are of particular interest since adults with severe HL using hearing amplification have been reported to make more other-initiations in conversation than their normally hearing conversational partners (Lind, Hickson & Erber, 2004; Pajo, 2013). However, we do not know whether this is the case also in interactions involving adults with a mild to moderate hearing loss using HA.

In any typical conversation, a common type of other-initiation of repair is to use an open form (e.g. *pardon*, *sorry*, *what, huh, hmm?*) that does not locate a specific repairable in the prior turn (Drew, 1997; for other languages see e.g., Dingemanse et al. 2014; for Finnish see Haakana, 2011). The following three examples show what forms of talk are commonly used in typical English conversations. The first type is vocalization *Huh*?/*Hmm?* (see example 1), the second question word *What*? (example 2), and the third an apologetic expression *Sorry/Pardon?* (example 3):

(1) Schegloff, Jefferson & Sacks 1977: 368

1 D: Wul did'e ever get married'r anything?	*PROBLEM*
2 C: **Hu:h?**	*OTHER-INITIATION (OI)*
3 D: Did he ever get married?	*REPAIR=REPEAT*
4 C: I have no idea.	

(2) Schegloff, Jefferson & Sacks 1977: 368

1 A: Have you ever tried a clinic?	*PROBLEM*

2 B: **What?** *OTHER-INITIATION (OI)*

3 A: Have you ever tried a clinic? *REPAIR=REPEAT*

4 B: ((sigh)) No, I don't want to go to a clinic.

(3) Drew 1997:71 (telephone conversation)

1 Lesley: I don'=if you want to go over there an' see them a:ll?

2 Norm: I can't I'm dialyzing at the mo-:ment. he[h *PROBLEM*

3 Lesley: [**Sorry?** *OTHER-INITIATION (OI)*

4 Norm: I'm dialyzing at the mome[nt. *REPAIR=REPEAT*

5 Lesley: [.hh Oh::

In the examples above, the open-class repair initiators express generally that there is some trouble with the reception of the prior turn, i.e., they do not target any specific element in the turn as the problem (cf. Schegloff, 2007:101). Instead, they address the prior turn as a whole. Thus, a common response to these open-class initiations is to repeat the whole or most of the problematic utterance. These repeating responses display the problem initially as a problem of hearing (cf. Svennevig, 2008). Open-class repair initiation has also been called *general repair initiation* and contrasted with specific repair initiations that target a particular segment in the previous talk (e.g., Lind, 2009). Also clausal utterances such as accounts, e.g., *I didn't catch that* and apologies, e.g., *beg your pardon* may be used as unspecified open-class repair initiations (Skelt, 2006). In this study, all listener responses that target the previous turn as a whole and leave the problem unspecified are analyzed as open-class other-initiations of repair.

The examples above also show how other-initiated repair sequences unfold turn by turn in typical conversation. Usually there is a three-part sequence of consecutive speaking turns: 1) the problem turn of the first speaker, which is followed by 2) the open-class other-initiation of repair by the interlocutor, and 3) the repetition of the problem turn by the original speaker. Other-initiated repair sequence thus interrupts and suspends the topical flow of the conversation to deal with the problem, and when the problem is solved, the original topic can continue. In examples 1 and 2, the speaker of the problem turn asks a question (line 1 in both examples) which can be answered (line 4) only after the problem has been resolved with an open-class initiation (line 2) and a repeat of the problem turn (line 3). In example 3, Norm produces an answer (line 2) after which Lesley initiates repair (line 3) and Norm repeats his answer (line 4). Only after that, Lesley can produce her response (line 5) to Norm's original answer turn and the conversation continues.

In Finnish conversations, the common forms of open-class repair initiations correspond to the English ones: question words *mitä* 'what' and its shortened version *tä*, as well as vocalization *hä* 'huh' are used (Haakana, 2011). Also apologetic forms *anteeksi* 'sorry/pardon' and clausal initiations, e.g. *en kuullut* 'I didn't hear', occur but are less frequent. In (4) there is an example of open-class repair initiation in Finnish typical conversation where friends are planning a trip to a forest.

(4) Haakana 2011:45 (telephone conversation)

01 Reijo: lehtiä ei oo puissa.

(there are) no leaves in the trees.

02 Pekka: .mt #ei: ei oo oikeen nyt#,

.tch no: no there aren't now,

03 Reijo: kheh kheh [kh [khh kmhh ((REIJO COUGHS))

04 Pekka: [sammalki o [vähä jäässä.

[**even moss is a bit frozen**. *PROBLEM*

05 (.)

06 Reijo:→ >mitä<?,

>what<?, *OTHER-INITIATION (OI)*

07 Pekka: sammalki o vähä jäässä, mhh

even moss is a bit frozen, mhh *REPAIR=REPEAT*

In line 4, Pekka makes a comment about frozen moss. At the same time, Reijo is coughing (line3) which may prevent him hearing properly what Pekka said. In line 6, after a micropause, Reijo other-initiates repair with the open-class initiator *mitä* 'what', and Pekka repeats his comment (line 7). In all four examples above the repair turn repeats almost word-by-word the original problem turn, although in examples 1 and 3 the repeated turn is in a bit more concise form than the original utterance.

As we have seen in the examples above, problems and repairs of reception occur in all conversations and participants with normal hearing use open-class repair initiations quite regularly (cf. also Dingemanse et al., 2015). In the data corpus of Finnish everyday and institutional conversations analyzed by Haakana (2011) there were 174 open-class repair initiations within 52 hours and 50 minutes, which means that on average open initiations occur approximately 3,3 times within one hour. When only everyday face-to-face interactions are considered, the occurrence is higher, 4,5 times within one hour. Similarly, in face-to-face interactions between native and non-native speakers of Finnish, there were 4,7 open-class repair initiations per hour (Lilja, 2010:95).

In typical conversations, open-class repair initiations often occur in conversational environments where there is overlapping talk or some topical discontinuity between the problem turn and its prior turn, i.e., topical shifts (Drew, 1997). Furthermore, open-class initiations can also occur when there is lack of alignment between the problem turn and the turns preceding it (Drew, 1997; Lilja, 2010:123). In those cases, open-class repair initiations treat the non-aligning turn as not properly fitted and inappropriate (Drew, 1997). In sum, open-class repair initiations occur more often in complex, trouble-prone conversational contexts where there are topical shifts, unexpected/non-aligning turns, overlapping talk or action, or background noise (Drew, 1997; Haakana, 2011; Lilja, 2010, Dingemanse et al. 2015).

Acquired hearing loss and open-class repair initiation

In conversations involving adults with acquired hearing loss, open-class repair initiations have been found to be the most common form of listener-initiated repair (Ekberg et al, 2017). The studies have also shown that adults with acquired HL using hearing amplification make significantly more open-class repair initiations than the adults with normal hearing in the same conversation (Lind et al., 2004; 2010; Pajo, 2013). In interactions recorded at the clinic studied by Lind et al. (2004), the clients using hearing amplification other-initiated repair significantly more often than their familiar conversational partners. In the home conversations Pajo (2013) studied, the HA users with acquired HL initiated on average 8 open-class repair sequences per hour, whereas their conversational partners made only 0,5 initiations per hour. The studies found concerned only few participants, seven (Lind et al., 2004) and five (Pajo, 2013), and the participants had severe hearing loss. Similar studies on

the conversational interactions of adults with mild to moderate HL were not found. More research on the impact of mild to moderate hearing loss on conversation is thus needed.

Prior studies have shown that English-speaking individuals with adult onset hearing loss use similar types of open-class repair initiations, 'what', 'huh' or 'pardon', as adults with normal hearing (e.g., Tye-Murray, Witt & Schum, 1995). In data sets gathered from clinical interactions, apologetic 'sorry' and 'beg your pardon' are found to be the most common format of open-class repair by the clients with HL (Ekberg et al., 2017). In Pajo's (2013) study, Finnish-speaking adults with severe HL used similar devices for open-class repair initiation as in English data, 'mitä' (*what*) and 'hä' (huh), but similarly with Haakana's (2011) Finnish corpus of typical conversations, apologetic expression 'anteeksi' (*sorry*/*pardon*) was seldom used. There may be some social-cultural variation that accounts for the differences between conversational practices in using apologetic expressions. In connection with acquired severe HL, the form of repair initiations has been found to differ from typical conversations to some extent, as HA users make use of multimodal resources such as pronounced vocal, facial and bodily expressions (Pajo & Klippi, 2013). For example, they may lean their heads and bodies towards the speaker and show puzzled facial expressions to which the speakers respond similarly as to verbal repair initiations.

In adults with HL, repair initiations are found to occur in conversational contexts where there is background noise, overlapping talk or actions, soft or blurred speech, or lack of visual access to the speaker's face (e.g., Pajo, 2012; Skelt 2006; Tye-Murray & Witt, 1996). Even in quiet one-to-one settings at hearing clinics, open-class repair initiations occur when the clinician is speaking while multitasking and the client has poor visual access to the clinician's face (Ekberg et al., 2017). Also familiarity between the

participants has been found to affect (Skelt, 2006) and not to affect (Tye-Murray et al., 1995) repair initiation.

When compared to typical conversations, open-class repair sequences in conversations involving adults with severe HL are found to be longer than three turns, and several successive repair initiations are needed in order to get the problem of reception resolved (Tye-Murray et al., 2010; Pajo, 2012). Furthermore, even if the repair is completed in three turns, a fourth turn, confirmation may occur (Lind et al., 2004; see example 5).

(5) Lind, Hickson & Erber, 2004:45

(HL=participant with hearing loss, FCP=frequent conversational partner)

01 FCP:	doesn't sound very profitable I s'pose they make profit	
02	on the coffee	PROBLEM
03	(0.3)	
04 HL: →	**don't mumble what↑**	OTHER-INITIATION
05	(0.9)	
06 FCP:	I said I guess they make a profit on the coffee even	
07	if they don't sell the book	REPAIR
08 HL:	even if they don't sell the book yeah	REPAIR CONFIRMATION

It is noteworthy that the problematic turn (lines 1-2) is followed by a short pause (line 3) after which the participant with HL initiates repair (line 4). The reaction is not quite immediate. Furthermore, the participant with HL first addresses the co-participant's way of talking with a directive (*don't mumble*) and then makes an open-class repair initiation marked with a rising pitch (*what*↑). Again, a pause follows after which the FCP clarifies his

prior turn (lines 5-7). The repair turn is not a simple repetition but makes reference to the speaker's action (*I said*), changes a verb (*I suppose→ I guess)* and also adds something to the prior turn (*they make profit on the coffee* ***even if they don't sell the book***). Finally, in line 8, the participant with HL repeats and confirms the last part of the FCP's turn.

In sum, according to previous studies the total number of open-class repair initiations and the structure of repair sequences, as well as the form of repair initiations in conversations involving adults with acquired HL may differ from conversations of normally hearing participants. The conversations involving adults with acquired HL can thus be less fluent and more oriented to potential trouble than the conversations between normally hearing participants (Skelt, 2006; Pajo, 2013). Although there is research on open-class repair initiations in conversations of older adult HA users with acquired severe HL, up to date little is known about middle-aged adults with mild to moderate HL using HA. In order to extend the research to the impact of hearing aids on open-class repair in connection with milder degrees of hearing loss, we examine how middle-aged HA users with acquired mild to moderate HL initiate repair using open-class repair initiations.

Aims of the study

This study examines open-class repair initiations by adults with acquired mild to moderate HL and their conversational partners. The method adopted is conversation analysis which studies the actions of the participants in actual naturally occurring interaction (Goodwin & Heritage, 1990). The research questions are the following:

- How frequently are open-class repair initiations used by adults with acquired mild to moderate HL using HA as compared to their normally hearing conversational partners?
- What types of open-class repair initiations are utilized?
- In which conversational contexts do the open-class repair initiations occur?
- How are the open-class repair sequences structured?

Methods

The study on open-class repair initiation in videotaped conversational interactions was part of the research project *Communication with the help of hearing aids: A comparative study of persons with acquired hearing loss in their interactions in private settings and with hearing health practitioners* (Academy of Finland, Grant nr. 40317). The study was conducted via the hearing clinics in two Finnish university hospitals in accordance with the Declaration of Helsinki, which guides research involving human subjects. The study was evaluated and approved by the hospital ethics committees (decision number 419/13/03/02/2009). After ethical approval the hearing clinics of the hospitals gave their consent to carry out the research in the clinic, and the participants to the study were recruited amongst the middle-aged clients who were being diagnosed with late onset acquired hearing loss and were

acquiring their first hearing aid. Information about the study and consent forms was sent to the clients along with the hospital appointment invitation letter. Participation in the study was voluntary and the participants provided their informed written consent to take part in the study before entering the rehabilitation.

The research setting of the project was longitudinal (8 month follow-up) with mixed method design to examine the outcome of hearing aid rehabilitation. Both self-assessment questionnaires and video recording of interactions were used for evaluating the outcome. The participants could choose whether they took part only by filling in the questionnaires or whether they also allowed their interactions in the hearing clinic, at home and/or work to be video recorded. Eighteen clients of altogether 144 participants of the study volunteered to be videotaped. The present study focuses on the videotaped data.

Participants with HL

The medical inclusion criteria were adult onset sensorineural hearing loss affecting both ears and the exclusion of neurological or mental illnesses and other hearing-related medical conditions, such as Ménière's disease. Only middle-aged participants with mild to moderate hearing losses were included in the study. The clients were diagnosed in the hearing clinics according to the EU classification, in which mild to moderate HL is defined as a mean hearing threshold between 20–70 dB in the better ear (BEHL; Better Ear Hearing Level). The BEHL mean threshold is based on hearing levels averaged over the frequencies 0.5, 1, 2 and 4 kHz PTA (Pure Tone Average). Of the 18 participants 12 were male and 6 were female with ages ranging 45 to 64 years. The participants were given codes and pseudonyms to anonymize them (see Table 1).

Table 1. Background information of the 18 participants with HL in videotaped interactions.

P with HL	Age	Sex	HL Type	HT R/L dB	BEHL dB	SRT R/L dB	SD R/L % cor	N of HA 1B, 1P, or 2
H001 Rauli	60	M	sn	60/48	48	50/40	92/96	2
H004 Jere	51	M	sn	44/40	40	30 / 20	96/ 92	2
H009 Juho	62	M	sn	26/28	26	15/15	88/96	2
H047 Jenni	45	N	sn	25/23	23	25/23	na	1B (left)
H052 Lari	61	M	sn	51/39	39	50/35	100/100	2
H054 Vesa	48	M	sn	45/48	45	40/40	92/100	2
H111 Liisa	52	N	sn	36/29	29	25/20	90/95	2
H124 Samu	64	M	sn	40/44	40	35/45	92/60	1NA
T007 Pertti	57	M	sn	120/35	35	deaf/24	0/90	1B(left)
T023 Pauli	54	M	sn	70/60	60	27/31	53/27	2
T031 Maija	56	N	mix	24/40	24	19/43	100/100	1NA
T037 Pekka	61	M	sn	31/38	31	21/18	93/97	2
T055 Ville	62	M	sn	36/36	36	14/13	97/97	2
T079 Leevi	62	M	sn	39/46	39	21/16	93/97	2
T101 Pia	48	N	sn	31/36	31	18/22	97/100	2
T103 Mia	56	N	sn	35/36	35	25/25	na	2
T104 Justus	61	M	sn	51/36	36	30/15	90/100	2
T129 Eveliina	54	N	sn	39/45	39	25/35	na	1NA

P=participant; HL=hearing loss; HL type=type of hearing loss; sn=sensorineural; mix=mixed; HT=hearing threshold; BEHL=better ear hearing level; SRT=speech recognition threshold; SD % cor=speech discrimination (percentage correct); 1B= HA was fitted unilaterally in the better ear, 1NA=information of the ear of fitting not available in hospital records; 2=HA was fitted bilaterally .

Before HA fitting, better ear hearing level (BEHL) averages of the participants varied from 23 to 60 dB. Thirteen of the participants had a mildly severe hearing loss in the better ear, ranging from 23 to 39 dB, and five a moderately severe, ranging from 40 to 60 dB. Two of the clients T007 Pertti and T023 Pauli had also unilaterally a more severe hearing problem in their poorer ear, with hearing thresholds 120 and 70 dB, respectively. Thirteen participants got a HA in both ears, five only in one. Unilateral HAs were fitted individually, often at the patient's request, only to one ear. The selection of the ear was made based on the hearing thresholds but also dexterity, handedness and possible physical restrictions in handling HAs were taken into consideration.

Video recorded conversational interactions

Video recordings took place at the hearing clinic in the beginning of the HA rehabilitation (HA pre-fitting and fitting appointments), at homes after one-month and 8-months of HA use, and at the work place after 2 to 4 months of HA use (see Table 2). Research interviews tapping the clients' experiences after 2 to 4 months of HA use were also recorded.

Table 2. Video recordings during the 8-month follow-up of HA use.

Beginning of rehabilitation	1 month HA use	2-4 months HA use	8 months HA use
Pre-fitting and fitting appointments	Interaction with family/friends	Interaction at work and research interviews	Interaction with family/friends

Video recordings of conversational interactions involving participants with HL were made in the HA rehabilitation encounters with hearing health professionals, i.e., audiometricians and ENT (ear-nose-throat) doctors, and at home with regular conversation partners who were family and/or friends. Seven of the 18 participants also gave permission to be videotaped in their daily interactions at work with their colleagues and other people taking part in the work interactions. All videotapes were recorded with the informed consent of all the participants. Consent was asked before the recording took place.

The 65 and a half hours of videotaped data include clinical, home, work and research interview interactions involving individuals with HL (Table 3). In the data, there were 26 hours of visits at the hearing clinic (including clients' interactions with ENT doctors and audiometricians, i.e., testing-prefitting, fitting, and some additional control visits), 15 and a half hours of conversations at home with familiar conversational partners, and 13 and a half hours of different kinds of conversational interactions at work (e,g. meetings, team work). The hearing conditions at the clinic and in the interview were optimal with no background noise and mainly only two people present, whereas at home and at work there was regularly background noise and multiple participants with overlapping talk and action.

Table 3. Length of recordings in videotaped data sets

Clinic	Home	Work	Interview	TOTAL
26 h 24 min	15 h 37 min	13 h 37 min	9 h 51 min	65 h 29 min

The researchers and/or research assistants recorded the interactions with one video camera and an external microphone. In most clinical and some work settings, the cameraman left the room when the recording started, if it was possible (i.e., participants were positioned

clearly in the camera view and did not have to move in the space). In home settings, the cameraman mainly stayed near the camera to take care of the recording as sound conditions were changing and people moved around. In addition, there was almost ten hours of videotaped dyadic research interviews between researchers and participants with HL on themes related to the participants' personal experiences with their HA rehabilitation. The interviews were videotaped by the interviewer who first started the camera and then conducted the interview. The data sets analyzed are thus Clinic, Home, Work, and Interview data. In the first testing-prefitting visits at the clinic the participants were not yet wearing HAs but in all other recordings they had the HAs on.

Transcription and analysis of the data

The data were analyzed using conversation analysis (CA) (e.g., Schegloff, 2007), which is a qualitative research method for describing conversational organization and the social actions of the participants. The analysis is based on sequential relevance: every action is related to the previous one and constructs relevancies for the next action (Goodwin & Heritage, 1990). In the analysis, the data were first transcribed following CA notation, including relevant nonverbal actions (see Appendix for transcription symbols). All the names of the participants and places were replaced with pseudonyms in the transcripts. With the help of transcripts the videotaped data were first explored in the project data sessions. The first data exploration revealed that the participants with HL regularly described how problematic it was for them to have to ask *what* all the time before acquiring HA. The problem descriptions were related to different kinds of conversations and social situations, both with familiar and less familiar conversational partners as the examples below demonstrate (see examples 6-9 below).

(6) Clinic data: Pre-fitting appointment (H047 with mildly severe HL)

Jenni: *at home it is then mainly that, that my son gets irritated when I ask "What? What?" "I still didn't hear". that I really didn't h hear he he he*

(7) Clinic data: Pre-fitting appointment (H052 with mildly severe HL)

Lari: *and so but really (0.5) uh the most awkward situations that came along during the who- whole business were that I start- (.) I got tired with that how I ask "what?" when people talk to me.*

(8) Clinic data: Pre-fitting appointment (H004 with moderately severe HL)

Jere: *But there are things like what I just feel are very unpleasant for me, for example when we talk in the car and, (0.5) then (1.0) when my wife says something in the other direction or, otherwise very quietly and then I ask "What?" so then, she always says like, "Well nothing really".*

(9) Interview data: Research interview after 3 months of HA use (H009 with mildly severe HL)

Juho: *Well, people noticed that I quite often asked "What? What?" And it was really so that I didn't hear, and understanding, too, was difficult, so that even though I heard that the other said something, I couldn't get it. And certain things, consonants and such, when I didn't hear them properly I couldn't make out the word the other was saying, and then I always had to ask. Now (when I use HA) they haven't commented on that whether the asking has become less, I think I still sometimes ask but less than before.*

The participants reported that the situations where they had to ask for clarification were awkward and that their conversational partners were irritated or gave up the clarification. Thus, we decided to examine in more detail how the participants were using open-class repair initiations (cf. Drew, 1997; Haakana, 2011) in their videotaped interactions. Besides the verbal means of open-class initiation, puzzled facial expression with raised eyebrows, turning the ear and leaning towards the recipient were identified as nonverbal means of indicating problems of reception. In our data these nonverbal means occurred simultaneously with verbal means and mainly in the first clinical encounters before using HAs. Nonverbal means were not analyzed or counted separately.

Scrutinizing the data, 126 open-class repair initiations were identified. Firstly, calculations of their occurrence in different contexts (Clinic, Home, Work, Interview) and by different participants (group 1=participants with HL vs. group 2=conversational partners) were made to allow comparisons. To compare different conversational contexts, frequencies per hour were counted. To examine whether HA users used more open-class repair initiations than their conversational partners in real-life situations, the significance of the difference in the frequency of initiations in everyday conversations (29 hours of Home and Work interactions) was tested statistically between the two participant groups. Because the data were not normally distributed in group 1 (Shapiro-Wilk, $p = .003$), a nonparametric Mann-Whitney test in IBM SPSS Statistics 24 software was run. In this analysis, the number of open-class initiations by the participants with HL wearing HAs was compared to the number of initiations by their interlocutors. The statistical analysis comparing participant groups focused on everyday contexts (i.e. conversational interactions with family and/or friends at home and with colleagues, customers etc. at work). The reason for choosing everyday contexts was that they were often multiparty interactions in more varying hearing

conditions than the clinical encounters. Furthermore, based on the interview data the participants had experienced social everyday conversations as especially challenging before HA fitting. We expected that examining the everyday social encounters would reveal whether the use of HA had diminished the need to use open-class repair initiations in their everyday life. To see the effect of HA use in general, we also examined whether there were misunderstandings or unintended topical shifts that might have been related to hearing problems, but as only very few could be identified, these were not analyzed further.

Secondly, the collection of 126 instances were also examined for the type of open-class repair initiation, i.e., for the kind of linguistic or nonverbal means used, to analyze whether they differed between contexts or participant groups. Thirdly, the structure of conversational sequences initiated by open-class initiators was examined turn-by-turn to see how open-class repair initiations emerged and how the repair was completed after the initiation. Finally, the immediate conversational context of the initiations was analyzed. In the structural and contextual analysis of the open-class repair sequences, the features of the speaking turns of both the adults with HL and their conversational partners were described turn-by-turn as they evolved. Also, the immediate conversational features (e.g., overlapping talk and actions) and the hearing conditions (e.g. prominent background noise hearable in the recording) were taken into account in the analysis.

Results

In the following, we first present the frequencies of open-class repair initiations in middle-aged adults with HL and their conversational partners. Then we examine the types of repair initiation, and finally analyze the initiations in their locally emerging contexts in more detail.

Frequency of open-class repair initiation

From the total of 126 open-class repair initiations, the adults with mild to moderate hearing loss initiated repair only slightly more often (n=65) than their interlocutors (n=61) (see Table 4). On average, there were approximately two open-class repair initiations in an hour (1.92/h) in the whole data corpus.

Table 4. Frequency of open-class repair initiation in Clinic, Home, Work and Interview contexts by individuals with HL and their conversational partners

Data set	Individuals with HL	Conversational partners	TOTAL
Clinic	13 (0,49/h)	8 (0,30/h)	21 (0,80/h)
Home	25 (1,60/h)	28 (1,79/h)	53 (3,39/h)
Work	24 (1,76/h)	24 (1,76/h)	48 (3.52/h)
Interview	3 (0,3/h)	1 (0,1/h)	4 (0.4/h)
TOTAL	65 (0,99/h)	61 (0,93/h)	126 (1.92/h)

When the overall frequencies in the different contexts were compared, in dyadic conversations at the hearing clinic (0.8/h) and in the interview (0.4/h) there were less open-class repair initiations than at home and at work (3.39/h and 3.52/h, respectively). In Home and Work data sets the multiparty settings and sound environments with background noise seem to have contributed to the more frequent occurrence of open-class repair initiations equally by both the participants wearing HAs and their conversational partners, whereas in the Clinic data set the participants with HL initiated repair more often than the professionals. The frequency of open-class repair by participants with HL in the Clinic data was probably increased as the data also includes the testing-pre-fitting encounters where the participants with HL did not yet wear HAs. There was no difference between participants with HL and their conversational partners in the Home and Work data sets where HA was already in use

Comparison of open-class repair initiations by participants wearing HAs and their conversational partners at everyday conversational contexts (Home and Work interactions) showed no statistically significant difference in the frequency between the groups (Z=-.536, Exact p= 0.592). In our home and work data the average frequency of open-class repair initiation (3, 4/h) was smaller but quite close to the average frequency (3,3/h) of Finnish typical conversation data (Haakana, 2011). On the other hand, the average open-class repair initiation frequencies in our home and work interactions differed notably from the home interaction average frequency of Finnish adults with severe HL using HAs, which has been found to be on average 8,1 initiations per hour (Pajo, 2013).

Types of open-class repair initiations

More than a half (n=68) of the 126 instances of open-class repair initiations in our data were made by using the interrogative *mitä* 'what' (Table 5). The second most common device was the particle *tä*/*häh* 'huh' (n=24) and the third the apologetic expression *anteeksi* 'sorry' (n=16). Clausal interrogatives and comments were less common (n=15) and repeats of the previous speaker's talk occurred only three times. When participant groups were compared, no differences were found between the HA users and their conversational partners in the types of open-class repair initiation they used.

Table 5. Types of open-class repair initiation in clinic, home, work and interview contexts

TYPE OF OCRI	CLINIC	HOME	WORK	INTERVIEW	TOTAL
Anteeksi [sorry]	11	0	4	1	16
Particles *tä, täh, häh* [huh]	1	11	10	2	24
Open interrogative *mitä* [what]	5	35	27	1	68
Clausal interrogative *Mitä sanoit* [what did you say]	0	2	6	0	8
Clausal comment *en kuullut* [I didn't hear]	3	3	1	0	7
Repetition	1	2	0	0	3
TOTAL	21	53	48	4	126

OCRI=open-class repair initiation

Comparing different contexts, it is noteworthy that apologetic expression *anteeksi* (sorry) mainly occurred at the clinic (n=11) and at work (n=4) and did not occur in home conversations. At home and at work, open interrogative *mitä* (what) and particles *tä*/*häh* (huh) were used more commonly. Similarly, both Haakana (2011) and Pajo (2013) found the particles and *mitä* (what) to be the most common form and *anteeksi* (sorry) only rare. Nonverbal means were not used independently to initiate repair but open-class initiations were occasionally accompanied with nonverbal means in the pre-fitting encounters where the participants did not yet use HAs (see also Example 10). In these cases the participants with HL turned their better ear towards or leaned closer to the professional.

Situational contexts and structure of open-class repair sequences

Open-class repair initiations in our data occurred mainly in complex contexts with background noise, overlapping talk or action, and topical shifts. These are the same trouble-prone contexts in which open-class repair initiations regularly occur in conversations universally (cf. Dingemanse et.al., 2015). Overall, the open-class repair sequences were short, consisting of three turns, and the repair turns were repetitions of the trouble source turn. Thus, the contexts and the structure of open-class repair sequences in conversations involving participants with mild to moderate HL were remarkably similar to open-class repair sequences in conversation generally (cf. Drew, 1997; Haakana, 2011; Dingemanse et al., 2015).

The following examples show the common contexts and the structure of open-class repair sequences in our data. The first context is topical shift during on-going competing activity (example 10). Example (10) comes from a pre-fitting encounter in the hearing clinic. The client is Juho, a man with a mild hearing loss who is being tested and

fitted to receive his first HA. Thus he is not yet wearing one. When the extract starts, the audiometrician is reading documents and adding the values from the documents to a computer program, focusing her gaze and attention on the computer (lines 1-5). While doing this she suddenly addresses the client, Juho, with a question concerning HAs, with a soft voice (line 5). This turns out to be a problem for Juho (lines 6-7). The right arrows indicate the point of open-class repair initiation.

(10) TOPICAL SHIFT DURING ON-GOING COMPETING ACTIVITY (CLINIC DATA)
Pre-fitting appointment. H009.1KU How do feel about trying these? CL=Juho, a client with mildly severe HL; AU=audiometrician.

01	AU:	∘∘(kolmekymmentä)∘∘
		thirty
		AUDIOMETRICIAN LOOKS AT DOCUMENTS AND WORKS ON COMPUTER
02		(1.0)
03	AU:	∘∘(viiskytviis)∘∘
		fifty five
04		(12 sec) AUDIOMETRICIAN WORKS ON THE COMPUTER
05	AU:	milläs mielellä sää nyt ∘kokeilet näitä∘.
		how do you now feel about trying these
		AUDIOMETRICIAN LOOKS AT THE COMPUTER AND THE DOCUMENTS
06→		(1.0)CLIENT LEANS AND TURNS HIS GAZE TOWARDS AUDIOMETRICIAN
07→	CL:	∘anteeks∘.
		sorry
08	AU:	millä mielellä sinä kokeilet näitä nyt.
		how do you feel about trying these now
		AUDIOMETRICIAN TURNS TO CLIENT AND LOOKS AT HIM
09	CL:	eh he heh odottavalla he [he he
		eh he heh **wait and see he[he he**
		CL LEANS BACK IN HIS CHAIR
10	AU:	[odot[tavalla.
		[**wait and see.**

We can see that the participants are not fully engaged in mutual conversation, as the audiometrician is concentrating on using a computer program (lines 1-4). Juho is sitting quietly paying no particular attention to the professional. The question addressed to him comes unexpectedly and shifts the topic from the practical arrangements of HA fitting to Juho's mind and what he thinks about trying the HAs (line 5). The situation is complicated by the fact that the professional is performing two activities at the same time and does not shift her bodily orientation to Juho when asking the question. Instead, she keeps on working and looking at the computer and documents and no visual cues of a question addressed to Juha are available: she is turned to the computer, there is no eye contact and Juho can't see her face properly. When starting to request for clarification, Juho first leans his body towards the professional and then asks *anteeks* 'sorry', which comes after a pause of one second (lines 6-7). The use of an apologetic expression may reflect the institutional character of this interaction: with the professional the client chooses a more formal way to initiate the repair.

As a response, the audiometrician repeats her question, now looking directly at Juho and slightly raising her voice (line 8). With the repeat the problem is solved and Juho can answer the question (line 9). The repair sequence consists of only three turns. It is noteworthy, that as Juho is not yet wearing HA, he leans towards the audiometrician to hear better and the professional also orients to a possible hearing problem by raising her voice when repeating the question.

The next example (11) depicts a topical shift during on-going competing activity, but in a more complex context with background noise and overlapping talk. Example comes from a home conversation between Lari, a HA user with a moderately severe HL, and his wife, who are sitting at a kitchen table drinking coffee. They have been discussing the forthcoming Olympic Games. When the extract starts, Lari is searching the newspaper for

the TV broadcast of the games: he is turning the pages, reading, and talking at the same time (lines 1-3 and 5). When Lari is engaged in this activity, the wife suddenly shifts the topic and asks a question about the coffee maker, overlapping with Lari's talk and actions (line 4). In this context, Lari initiates repair using the most common open-class initiator *mitä* 'what' (line 6).

(11) TOPICAL SHIFT DURING COMPETING ON-GOING ACTIVITY WITH OVERLAPPING TALK AND BACKGROUND NOISE (HOME DATA)
H052.11KO Did you switch off? LA=Lari, HA user with moderately severe HL; WI=his wife.

01 LA: teevees.
in the telly.
LARI LOOKS FOR TV PROGRAM INFO IN THE NEWSPAPER

02 (1.0)

03 LA: ää,(0.2) y:h,(2.5)[ei tää,
ah u:h not this
LARI LOOKS AT NEWSPAPER AND TURNS PAGES,PAPER RUSTLES

04 WI: na[psasit sä pois ton keittimen.
did you switch off that(coffee)maker
WIFE LOOKS AT LARI AND POINTS AT THE COFFEE MAKER

05 → LA: tää on niin, (0.2) >mitä?<
this is so, >what?<
LARI INTERRUPTS & SHIFTS HIS GAZE TO HIS WIFE

06 (0.2)

07 WI: napsasitko pois ton kahvinkeittimen.
did you switch off that coffee maker
WIFE POINTS AT THE COFFEE MAKER

08 LA: no empä tietenkää.
well of course I didn't

09 (1.0) LARI RETURNS TO SCANNING THE PAPER

10 LA: käy nappaamassa pois [mä katon sil ai-
go and switch it off I'll look in the mean-
11 WI: [joo,
[**okay,**
12 LA: koitan sil[lä aikaa löytää sen.
in the meantime I'll try to find that (program).

The open-class initiation is produced quickly with a high rising pitch displaying astonishment towards the co-participant's action (cf. Selting, 1996). The problem is solved immediately when the wife repeats the question (line 7) and Lari answers it (line 8). The repair sequence consists of three turns and the conversation continues. In home conversations, the contexts where repair was initiated were overwhelmingly complex as there were many contextual factors besides topical shifts that may have influenced the hearing.

Disagreement between the participants is a context where open-class repair initiations also occurred in our data. Example (12) comes from a workplace environment, where Pertti, a HA user with a moderately severe HL, is renovating an apartment with his workmate Jari. Jari is kneeling down looking at the bathroom floor while Pertti is looking at him with a jointing extruder in his hand. They talk about finishing the seaming and disagree how it should be done. Similarly, as in the previous example, the HA user initiates repair with *mitä* 'what', which is the most common form of open-class initiation in our data sets.

(12) DISAGREEMENT BETWEEN THE PARTICIPANTS (WORK DATA)
T007.5TY Jointing compound. Pertti=HA user with moderately severe HL; Jari=workmate.

01 Pertti: mutta saumana (.)saumat ne varmaan vähä
but as seams (.) the seams those surely

02 paremman näkönen on [(.)=
would look better

03 Jari: [JARI TURNS TO LOOK AT PERTTI

04 Pertti: =kun tää
than this
PERTTI LIFTS AND SHOWS THE JOINTING EXTRUDER TO JARI

05 Jari: ei toi näy mihkään.
that doesn't show anywhere.

06 → Pertti: >mitä<=
>what<=

07 Jari: =ni eihän se ny mihkään näy ku se on väritön=
=so it doesn't show anywhere as it's colourless=

08 Pertti: =ei tietysti mutta siinä vaan näkyy se- (.)
=of course not but you can see that- (.)

09 sauman peittäs se (.) muu.
the other one would cover the (.) seam.
PERTTI COUGHS

10 Jari: JARI STARTS TO BLOW THE TILES WITH AIR BLASTER

In here, Pertti and Jari have disagreeing opinions about how to cover some seams on the floor. Jari is starting to blow-dry the tiles when Pertti comments that proper seaming would look better than the one in the jointing extruder that he is holding in his hand (lines 1-2,4). Jari turns to him from his kneeling position giving him a silent challenging look (line 3) and states *eihän toi näy mihkään* 'that doesn't show anywhere' (line 5). Pertti responds with a very quickly produced open-class repair initiation *mitä* 'what' (line 6). Jari repeats his utterance but adds also a justification to his claim (line 7), thus treating Pertti's repair initiation as a challenging request to explain more to support his view. Conversation continues as Pertti disagrees (lines 8-9). In this case, the complexity of the situation arises from the disaligning views of the participants. In this kind of situations, open-class repair initiations are used to treat the non-aligning turn as not properly fitted and inappropriate (cf. Drew, 1997). Here the disagreement is not solved but the conversation ends as Jari starts to blow the tiles with air blaster. The repair sequence is short consisting of only three turns.

To conclude, features of the contexts preceding open-class repair initiation included competing simultaneous activities, topical shifts, overlapping speech or background noise, lack of eye contact, soft voice quality, unexpectedness, and disagreement. These features brought complexity to the context that affected both the HA users and their conversational partners.

Discussion

The main finding of the study was that adult hearing aid users with acquired mild to moderate hearing loss use open-class repair initiations as often and in a similar fashion as their interlocutors. When frequencies were examined, there was no statistically significant difference between the groups: HA users did not make initiations more frequently than their conversational partners. Our findings on HA users with mild to moderately severe HL are in contrast with the previous findings of conversations involving participants with severe acquired HL using hearing amplification (e.g., Lind et al., 2004; Pajo, 2013). HA users with severe HL are found to make significantly more open-class repair initiations than their interlocutors. In our data the distributions of open-class repair initiations in everyday conversations between HA users and their conversational partners were quite even, 48 and 52, respectively. This differed remarkably from Pajo's (2013) findings of everyday conversations involving six Finnish-speaking couples: in her data the HA users with severe HL made notably more open-class repair initiations than their normally hearing conversational partners, 68 and 5, respectively. Also in the data collected by Lind et al (2004), the adults with severe HL made more other-repair initiations than their conversational partners, 98 and 19, respectively. The differences between our findings on mild to moderate HL and the prior studies on severe HL suggest that the severity of HL may affect the frequency of open-class repair initiation in conversation by participants using hearing amplification. Furthermore, in our data the overall average frequency of open-class repair initiations (3,4 per hour) was quite similar, although a little smaller, than the frequency (3,3 per hour) in the Finnish corpus of typical conversations by Haakana (2011). In Pajo's home conversation data of participants with severe HL the total occurrence of open-class repair initiations was much more frequent, 8,1 per hour. Since Pajo's data and our data share the same social-cultural

background, the reason for the difference between the findings is likely to be in the severity of hearing loss.

One may ask why in our data were there not more open-class repair initiations although there were participants who had reported to use them before acquiring hearing aids. One explanation would be that HA rehabilitation had been successful: in connection with mild to moderate HL the HA had amplified hearing successfully so there was less need for open-class repair initiation. However, as our conversational data from 18 HA users is still quite small, more research on the connection of the degree of hearing loss with HA users' open-class repair initiation behaviors is needed. In further studies it would also be necessary to compare conversations of adults with mild HL and moderate HL, and analyze all kinds of other-initiations of repair in addition to the open-class repair initiations. It may be that the participants use more specific repair initiations when their hearing improves with HA use. Also, the low frequency of open-class repair initiations may be connected to the fact that the participants reported them as awkward and stigmatizing, and may thus avoid using them. However, in case of avoidance, if hearing problems were not addressed, there should have been conversational breakdowns such as misunderstandings and unintended topical shifts, which was not the case.

The types of open-class repair utilized did not differ between HA users and their conversational partners. We also did not find prominent reliance on nonverbal means (e.g., puzzled face, raised eye brows) which has been observed in Skelt (2006) and Pajo & Klippi (2013). The most common type was the interrogative word *mitä* 'what' that was used in half of the initiations. Vocalization *hä* 'huh', apologetic expression *anteeksi* 'sorry' and clausal initiations (e.g. 'what did you say'/'I didn't hear') occurred less often. The findings on the types of open-class initiations was similar to prior studies on Finnish-speaking typical

conversations (e.g., Haakana, 2011) and conversations involving adults with acquired HL (e.g., Pajo, 2013). Similarly, the three types, *what*, *huh* and *sorry* have been found in English conversations involving participants with acquired HL (e.g., Tye-Murray et al., 1995), but information about their relative frequencies is scarce. However, Ekberg et al. (2017) found apology-based open-class initiations to be the most common type of repair initiation in their data. This is different from our findings and may reflect cultural preferences in the use of repair practices. Ekberg et al. (2017) analyzed only conversations between HA users and hearing professionals, in which the institutional setting may have influenced the practices. In our data there was also a tendency to use apologetic expressions in clinical encounters. More comparative research is still needed to explore the possible cultural and situational variation.

Regarding context, in our data open-class repair initiations tended to emerge in complex trouble-prone situations with background noise, competing activities, disagreements, overlapping talk, and topical changes. This kinds of contexts increase open-class repair in conversations universally (e.g., ; Dingemanse et al., 2015; Haakana, 2011). Thus our findings did not differ from typical conversations in this respect. In the current study's clinical interactions, where the participants with HL were not yet wearing HAs, open-class repair initiations occurred in connection with a lack of eye contact with the hearing professional in multi-tasking environments, which is in line with the similar findings of HA users by Ekberg et al. (2017). As a whole, in our data the occurrences of open-class repair initiations cropped up in home and work interactions where there was more variety in activities, hearing conditions, participants, and topics discussed. This is in line with the studies that have found noisy multiparty settings to increase requests for clarification (e.g.,

McKellin et al., 2007). Even in these environments the average frequency of occurrence in our data was similar to Finnish typical conversations (cf. Haakana,2011).

The structure of the open-class repair sequences was similar to what has been observed in conversation generally (Schegloff, 2007, Dingemanse et al., 2015). There were three-part sequences in which open-class repair initiations most often led to repetition by the interlocutor, which immediately repaired the conversational breakdown. Long clarification sequences with multiple repair initiations did not occur. This finding is in contrast with the prior studies on conversations of adults with severe HL were repair sequences have been observed to be extended (e.g. Lind et al. 2004; Pajo, 2012).

To conclude, according to our findings in conversations involving HA users with mild to moderate HL the frequency, types, and contexts of open-class repair initiations and the structure of open-class repair sequences were remarkably similar to typical conversation (cf. Drew, 1997; Haakana, 2011; Schegloff, 2007). Similarly as in typical conversation, repair sequences were short and conversational breakdowns swiftly repaired. The findings thus differ from prior studies on conversations with participants with severe HL using hearing amplification. This indirectly suggests that hearing aid is successful in restoring hearing in everyday conversation when the hearing loss is mild to moderate. The findings diminish the stigma related to hearing loss, hearing aids, and the use of open-class repair. Our findings should encourage adults with mild to moderate HL to use hearing amplification and to recognize open-class repair initiators as a normal and beneficial conversational resource that their interlocutors with normal hearing also regularly use. Furthermore, the knowledge of repair behaviors can be utilized in communication therapy and counseling to develop conversation-based assessment and therapy techniques.

Acknowledgements:

We thank all HA users and their conversational partners who volunteered to take part in this study and agreed to be videotaped. Academy of Finland is gratefully acknowledged for funding the project. We also wish to thank Helsinki University Hospital, Tampere University Hospital, Kuulotekniikka Ltd, The Finnish Federation of Hard of Hearing, and Finnish Institute of Occupational Health for invaluable collaboration. The study could not have been done without the work of the research assistants and MA students who collected and transcribed the data: Vappu Carlson, Mervi Karhunen, Susanna Koski, Vilma Martikainen, Tiina Pakka, Juha Ranta, Kati Turunen, Sanni Vatanen, and Teija Vaittinen. Last but not least, we wish to thank Dr. Maria Egbert, the coordinator of Hearings Aids Communication researcher network, who gave us the decisive inspiration to start this study.

References

CIORBA, A., BIANCHINI, C., PELUCCHI, S., & PASTORE, A. (2012) The impact of hearing loss on the quality of life of elderly adults. *Clinical Interventions in Aging, 7,* 159–163.

DAVID, D. & WERNER, P. (2016). Stigma regarding hearing loss and hearing aids: A scoping review. *Stigma and Health*, 1, 59-71.

DAVIS, A., SMITH, P., FERGUSON, M., STEPHENS, D. & GIANOPOULOS, I. (2007). Acceptability, benefit and costs of early screening for hearing disability: a study of potential screening tests and model. *Health Technology Assessment*, 11, 42, 1-294.

DAWES, P., FORTNUM, H., MOORE, D. R., EMSLEY, R., NORMAN, P., CRUICKSHANKS, K., DAVIS, A., EDMONDSON-JONES, M., MCCORMACK, A., LUTMAN, M., & MUNRO, K. (2014). Hearing in middle age: a population snapshot of 40–69 year olds in the UK. *Ear and Hearing 35,* 44–51.

DREW, P. (1997). 'Open' class repair initiators in response to sequential sources of troubles in conversation. *Journal of Pragmatics, 28,* 69-101.

DINGEMANSE, M., BLYTHE, J., & DIRKSMEYER, T. (2014). Formats for other-initiation of repair across languages: An exercise in pragmatic typology. *Studies in Language, 38,* 5−43.

DINGEMANSE, M., ROBERTS, S.G., BARANOVA, J., BLYTHE, J., DREW, P., FLOYD, S., GISLADOTTIR, R.S., KENDRICK, K.H., LEVINSON, S.H., MANRIQUE, E., ROSSI, G., & ENFIELD, N.J. (2015). Universal principles in the repair of communication problems. PLOS ONE 10(9): e0136100. DOI:10.1371/journal.pone.0136100

EKBERG, K., HICKSON, L. & GRENNESS, C. (2017) Conversation breakdowns in the audiology clinic: the importance of mutual gaze. *International Journal of Language & Communication Disorders*, 52, 3, 346–355.

ERLER, S.F., & GARSTECKI, D.C. (2002). Hearing loss- and hearing aid-related stigma: Perceptions of women with age-normal hearing. *American Journal of Audiology, 11,* 83–91.

GAGNÉ, J.P., STELMACOWICH, P., & YOVETICH, W. (1991). Reactions to requests for clarification used by hearing-impaired individuals. *Volta Review, 93,* 129–143.

HAAKANA, M. (2011). *Mitä* ja muut avoimet korjausaloitteet [*What* and other open-class repair initiations, in Finnish]. *Virittäjä, 115*, 36-67.

HANNULA, S., MÄKI-TORKKO, E., MAJAMAA, K. & SORRI, M. (2010). Hearing in a 54- to 66-year-old-population in northern Finland. *International Journal of Audiology*, 49, 920–927.

HÉTU, R. (1996). The stigma attached to hearing impairment. *Scandinavian Audiology, 25,* 12−24.

GOODWIN, C., & HERITAGE, J. (1990). Conversation analysis. *Annual Reviews of Anthropology, 19,* 283–307.

KRAMER, S.E., KAPTEYN, T.S. & FESTEN, J.M. (1998). The self-reported handicapping effect of hearing disabilities. *Audiology*, 37, 301–312.

LILJA, N. (2010). *Other-initiated repair sequences in Finnish second language interactions* [in Finnish]. Jyväskylä: University of Jyväskylä.

LIND, C. (2009). Conversation repair strategies in audiologic rehabilitation. In J. J. Montano and J. B. Spitzer (eds), *Adult Audiologic Rehabilitation* (San Diego, CA: Plural), pp. 217–241.

LIND, C., HICKSON, L., & ERBER, N. (2004). Conversation repair and acquired hearing impairment: a preliminary quantitative clinical study. *The Australian and New Zealand Journal of Audiology, 26,* 40–52.

LIND, C., HICKSON, L., & ERBER, N. (2010). Who said what? Sampling conversation repair behavior involving adults with acquired hearing impairment. *Seminars in Hearing, 31,* 104–115.

MCCORMACK, A., & FORTNUM, H. (2013). Why do people fitted with hearing aids not wear them? *International Journal of Audiology 52*, 360–368.

MCKELLIN, W., SHAHIN, K., HODGSON, M., JAMIESON, J. & PICHORA-FULLER, K. (2007) Pragmatics of conversation and communication in noisy settings. *Journal of Pragmatics* 39, 2159–2184.

NASH, S. D., CRUICKSHANKS, K. J., KLEIN, R., KLEIN, B. E. K., NIETO, F. J., HUANG, G. H., PANKOW, J.S., & TWEED, T. S. (2011). The Prevalence of Hearing Impairment and Associated Risk Factors. *JAMA Otolaryngology - Head and Neck Surgery, 137,* 432–439.

NEWMAN, C.W., JACOBSON, G.P., HUG, G.A. & SANDRIDGE, S.A. (1997). Perceived hearing handicap of patients with unilateral or mild hearing loss. *Annals of Otolaryngology, Rhinology and Laryngology*, 106, 210–214.

PAJO, K. (2012). "One gets along enough to make it work": a case study of local contexts prior to miscommunication between a hearing-impaired man and his spouse. *Journal of Interactional Research in Communication Disorders, 3,* 221−249.

PAJO, K. (2013). The occurrence of 'what', 'where', 'what house' and other repair initiations in the home environment of hearing-impaired individuals. *International Journal of Language & Communication Disorders, 48,* 66−77.

PAJO, K., & KLIPPI, A. (2013). Hearing-impaired recipients' non-vocal action sets as a resource for collaboration in conversation. *Journal of Pragmatics, 55,* 162−179.

SALONEN, J., JOHANSSON, R., KARJALAINEN, S., VAHLBERG, T., JERO, J-P., & ISOAHO, R. (2013) Hearing aid compliance in the elderly. *B-ENT, 9,* 23-28.

SCHEGLOFF, E.A., JEFFERSON, G., & SACKS, H. (1977) The preference for self-correction in the organization of repair in conversation. *Language, 53,* 361–382.

SCHEGLOFF, E.A. (2007). Sequence organization in interaction. Cambridge, Cambridge University Press.

SELTING, M. (1996). Prosody as an activity-type distinctive cue in conversation: The case of so-called' astonished 'questions in repair initiation. In Couper-Kuhlen, E., & Selting, M. (eds.), *Prosody in conversation: Interactional studies,* pp. 231-270. Cambridge: Cambridge University Press.

SKELT, L. (2006). *See what I mean: Hearing loss, gaze and repair in conversation.* Unpublished PhD thesis. Canberra, Australia: The Australian National University.

SOUTHALL, K., GAGNÈ, J-P., & JENNINGS, M. B. (2010). Stigma: A negative and a positive influence on help-seeking for adults with acquired hearing loss. *International Journal of Audiology, 49,* 804–814.

STEVENS, G., FLAXMAN, S., BRUNSKILL, E., MASCARENHAS, M., MATHERS, C.D., & FINUCANE, M. (2011). Global and regional hearing impairment prevalence: an analysis of 42 studies in 29 countries. *European Journal of Public Health,* 23, 146-52.

SVENNEVIG, J. (2008). Trying the easiest solution first in other-initiation of repair. *Journal of Pragmatics, 40,* 333-348.

VESTEGAARD KNUDSEN, L., ÖBERG, M., NIELSEN, C., NAYLOR, G., & KRAMER, S.E. (2010). Factors influencing help seeking, hearing aid uptake, hearing aid use and satisfaction with hearing aids: A review of the literature. *Trends in Amplification, 14,* 127−154.

TAMBS, K. (2004). Moderate effects of hearing loss on mental health and subjective well-being: Results from the Nord-Trøndelag Hearing Loss Study. *Psychosomatic Medicine,* 66:776–782

TYE-MURRAY, N., MAUZE, E., & SCHROY, C. (2010). Receive readily, recognize genuinely: Small talk and cooperative behaviors. *Seminars in Hearing, 31,* 145-164.

TYE-MURRAY, N. & WITT, S. (1996). Conversational moves and conversational styles of adult cochlear-implant users. *Journal Academy of Rehabilitative Audiology*, XXIX: 11–25.

TYE-MURRAY, N., WITT, S., & SCHUM, L. (1995). Effects of talker familiarity on communication breakdown in conversations with adult cochlear implant users. *Ear and Hearing, 16,* 459-469.

Appendix: Transcription symbols in conversation.

(.)	A micropause, which is less than 0.2 seconds
(0.4)	A measured pause is indicated in tenths of seconds
[	Left square bracket, one above the other on two successive lines with utterances (or responsive nonverbal action) of two different speakers, indicates the point of overlap onset.
]	Right square bracket indicates the end of overlap.
=	Equal signs come in pairs, one in the end of a line and at a start of another line to mark 1) same speaker's continuous utterance, which was broken up to accommodate the placement of overlapping talk, or 2) to indicate that the turn of a different speaker followed the first speaker with no discernable silence between them.
.	Full stop indicates falling intonation.
,	A comma indicates level intonation.
?	Question mark indicates rising intonation.
↑	Upward arrow indicates a sharp rise in pitch compared to the pitch register with which the utterance otherwise was produced.
> <	A combination of "more than" and "less than" symbols indicates that the talk in between them is compressed or rushed.
:	A colon indicates the prolongation of a sound just preceding it.
#	Creaky voice quality.
◦soft◦	Degree symbols indicate soft voice. When there are two degree signs, the talk between them is markedly softer than the talk around it.
COUGHS	Participant's non-verbal actions are described with small capital letters below the utterance they co-occur with, or on a line of their own, if they occur without simultaneuous speech by the participant.
P: COUGHS	